Apple II
Technical Notes

Developer Technical Support

Apple IIGS
#95:   ROM Diagnostic Errors

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This Technical Note describes errors returned by the ROM Diagnostics on Apple IIGS systems.

The Built-In Diagnostics Revealed

The IIGS has a self-test capability in ROM. The self-test is activated by pressing Open-Apple and Option on power up, or Open-Apple, Option, and Reset. During the test, the test number is visible on the bottom of the screen followed by six zeros. After all tests are complete, a continuous 6 KHz one-second beep sounds and the screen displays a `System Good` message. If any test fails, the screen displays a message of the form `System Bad: AABBCCDD` on the lower left hand side and a staggered `AABBCCDD` on the upper left hand side to help read the error code in the event of a RAM failure. In the event of video failure, the failure code is also sent to the printer port. In the number contained in the error message, `AA` is the test number that failed and the failure code is embedded in the `BB`, `CC`, and `DD` fields. The complete failure codes for each of the 12 tests are as follows:

Self Test 1: ROM Test

`AA` =   01
`BB` =   Failed checksum
`DD` =   01 if the test encountered bad RAM and the error code is a RAM error code similar to the RAM Test error codes

For a failure in ROM, the ROM diagnostics also display `RM` on the top left hand corner of the screen.

Self Test 2: RAM Test

`AA` =   02
`BB` =   Bank Number (or $FF for ADB Tool call error)
`CC` =   Bit(s) failed

Self Test 3: Soft Switches and State Register Test

`AA` =   03

BB =   State Register bit (if any)
CC =   Low byte of soft switch address

Self Test 4: RAM Address Test

```
AA  =     04
BB  =     Failed bank number (or $FF for ADB Tool call error)
CCDD  =   Failed address
```

Self Test 5: Speed Test

```
AA  =     05
BB  =     01:  Speed stuck slow
          02:  Speed stuck fast
```

Self Test 6: Serial Test

```
AA  =     06:
BB  =     01:  Register R/W
          04:  Tx Buffer empty status
          05:  Tx Buffer empty failure
          06:  All Sent Status fail
          07:  Rx Char available
          08:  Bad data
```

Self Test 7: Clock Test

```
AA  =     07
DD  =     01:  Fatal error occurred and the test is aborted
```

Self Test 8: Battery RAM Test

```
AA  =     08
BB  =     01:  Address test and CC  = bad address
          02:  Non-volatile RAM failed and CC  = pattern, DD  = address
```

Self Test 9: Apple Desktop Bus Test

```
AA  =     09
BBCC  =   Bad checksum
DD  =     01:  Apple Desktop Bus tools call encountered a fatal error, no checksum  computed.
```

Self Test 10: Shadow Register Test

```
AA  =     0A
BB  =     01:  Text page 1 fail
          02:  Text page 2 fail
          03:  Apple Desktop Bus Tool call error
          04:  Power On Clear bit error
```

Self Test 11: Interrupts Test

AA =   0B
BB =   01: VBL interrupt time-out
        02: VBL IRQ status fail
        03: 1/4 sec interrupt
        04: 1/4 sec interrupt
        05:
        06: VGC IRQ
        07: Scan line

Self Test 12: Sound Test

AA =   0C
DD =   01: RAM data error
        02: RAM address error
        03: Data register failed
        04: Control register failed
        05: Oscillator interrupt timeout

Further Reference

- *Apple IIGS Hardware Reference*, Second Edition